Claims

[c1] 1.A method for imaging and measuring microscopic three-dimensional structures, comprising the following steps:
depicting a data set in three-dimensional form on a display associated with a microscope;
defining at least one arbitrary section position and an arbitrary rotation angle;
rotating the three-dimensional depiction on the display until a structure contained in the three-dimensional form reproduces on the display a depiction that appears suitable to the user for further processing; and
performing an analytical operation on the structure.

[c2] 2.The method as defined in Claim 1, wherein upon definition of the rotation angle, a transformation matrix is calculated; and upon definition of the section position, corresponding section planes are calculated.

[c3] 3.The method as defined in Claim 2, wherein the corresponding section planes are depicted on the display, and the depiction of the sectional geometry is implemented in the form of a wire-frame model made up of an outer and an inner cuboid.

[c4] 4.The method as defined in Claim 1, wherein an "orthosectioning" view is assembled in a first window, from multiple images each from a different viewing direction, in such a way that the images are lined up with one another at the corresponding edges, the current position of the images being indicated by a respective crosshairs.

[c5] 5.The method as defined in Claim 4, wherein the position of the images is modified interactively by way of the crosshairs by manipulation by means of an input device, such that in the individual regions, the images are updated during modification and the image content is modified accordingly.

[c6] 6.The method as defined in Claim 1, wherein at least one length to be measured is determined in an imaged volume, the length being defined by a first and a second position and the geometric distance between the two positions representing the desired length.

[c7] 7.The method as defined in Claim 6, wherein the user navigates into the plane in which the first position is located, and marks it; the user then navigates into the plane in which the second position is located, and marks it; and based on the first and second positions, a PC calculates and visualizes the geometric distance.

[c8] 8.The method as defined in Claim 1, wherein at least one obliquely oriented plane or a set of discrete points is determined in a volume; the at least one obliquely located plane is determined or selected by way of a corresponding graphical drawing tool or an automatic function; and the obliquely oriented plane is marked with a continuous line.

[c9] 9.The method as defined in Claim 1, wherein multiple surfaces are assembled into a stack that represents a three-dimensional volume; and specific analyses are performed on the volume.

[c10] 10.The method as defined in Claim 9, wherein scan parameters are applied exclusively to the selected volume.

[c11] 11.The method as defined in Claim 9, wherein the selected volume represents a three-dimensional curve; and a scanning microscope is controlled in such a way that only points on the three-dimensional spatial curve are scanned.

[c12] 12.An arrangement for imaging and measuring microscopic three-dimensional structures, comprising:

- a microscope,
- a display associated with the microscope,
- a PC,
- an input device associated with the PC,
- a first window shown on the display for depicting a plurality of section planes, from viewing directions differing in each case,
- a second window shown on the display for depicting a rotational view,
- a third window shown on the display for a visual depiction of the coordinates, the rotation angle, and a section position; and
- a respective crosshairs is shown in the depiction of each section plane, for

interactive modification of the section position, wherein the image content in the first window is updated in accordance with a modification.

[c13] 13.The arrangement as defined in Claim 12, wherein in the first window an image of the XY plane, an image of the XZ plane, and an image of the YZ plane is depicted, the respective images being lined up with one another at the corresponding edges, and the current position of the images being indicated by the respective crosshairs.

[c14] 14.The arrangement as defined in Claim 12, wherein in the first window, at least one length to be measured can be determined, the length being defined by a first and a second position and the geometric distance between the two positions representing the desired length in the imaged volume.

[c15] 15.The arrangement as defined in Claim 14, wherein an input device is employed to define the first and second positions.

[c16] 16.The arrangement as defined in Claim 14, wherein a coordinate window that numerically depicts the determined lengths to the user is depicted on the display.

[c17] 17.The arrangement as defined in Claim 12, wherein a graphical drawing tool or an automatic function is provided which allows the user to generate in the first window, within a selected area, a continuous line that defines a ROI.

[c18] 18.The arrangement as defined in Claim 17, wherein a volume can be constructed from multiple ROIs; and a computer program is provided for determining the best possible scanning geometry, taking into account signal-theory considerations and the microscope technique presently in use.